APPENDIX I.

EXAMPLES SHOWING THE RELATION OF THE RATE OF PROFITS TO SURPLUS-VALUE.

A CONCRETE example from Massachusetts will make clear the conclusions in the text to those not accustomed to algebraic analysis in Economics.

Seventy-two establishments engaged in the manufacturing of brooms, brushes and mops on the one hand, and 378 stone manufactories on the other hand, fully satisfy the requirements of our problem. The capital invested per establishment is nearly equal in both branches—$9,352 in the former and $10,175 in the latter[1]; every $10,000 worth of capital employs 17.7 hands in stone making, and only 14.5 hands, *i. e.*, 18 per cent. less, in the manufacturing of brooms, brushes, and mops. The value produced each year per laborer, *i. e.*, the sum of wages and gross profits,[2] is the same in both industries ($575.38 and $574.70), the difference being only 68 cents a year per laborer; and at the same time the rate of net profits differs but slightly in both industries, 22.18 per cent. and 20.11 per cent., the balance even inclining in favor of the industry employing less labor.

By what process is this result attained? Simply by an increase in the rate of surplus-value from 44.68 per cent. to 81.83[3] per cent., which amounts to a reduction in wages from $397.22 to $316.44 a year.

Let us now test our formula on the ground of the figures here

[1] *Twenty-First Annual Report of the Bureau of Labor Statistics*, pp. 284, 285, 378, 379.

[2] P. 573, No. 8; p. 575, No. 32.—In reality the two quantities do not exactly cover one another. The Report includes wear and tear under gross profits, while it makes a deduction for rent and taxes, which in Marx's analysis enter into surplus value. Still, in the examples selected this divergence can safely be disregarded, inasmuch as in the stone industry rent and taxes amount together to 1.13 per cent. of the selling price, and depreciation 1.10 per cent. of the selling price,—a difference of only .03 per. cent. (p. 379.) The difference is more considerable in the manufacture of brooms and brushes. Still it does not exceed .96 per cent of the selling price, which comes to not more than 2 per cent. of the total value produced per year. (p. 285.)

[3] *Ibid.*, pp. 582, 584.

adduced, first reducing all items to a common basis of $10,000 worth of capital invested.

In the expression:

$$v = \left(1 + \frac{1}{\sigma}\right) \frac{(F + M + P + B)\,\pi + i + e + r}{l}, \qquad \text{(A)}$$

substitute the following figures for the stone industry:

$v = \$574$, $\sigma = 45$ per cent.,
$F + M + P + B = \$10{,}000$, $\pi = 20$ per cent.,
$l = 17.4$,
$i + e + r = 11$ per cent. of capital invested, all charges for interest, commissions, rent, taxes, etc., being here included.

We thus obtain the identity:

$$574 \equiv \left(1 + \frac{1}{.45}\right) \frac{.20 \times 10{,}000 + .11 \times 10{,}000}{17.4}.$$

In the manufacturing of brooms, brushes and mops the value produced per hand, the amount of capital, and the rate of profit remain the same as above, but the number of hands is decreased by one-sixth, *i. e.*, to 14.5. We propose now to solve the following problems:

(1) *The rate of surplus-value, and therefore the scale of wages, remaining the same, find the amount that can be allowed for interest, rent, taxes, commissions, etc.*

We have (Formula A):

$$574 = \left(1 + \frac{1}{.45}\right) \frac{.20 \times 10{,}000 \times x}{14.5},$$

whence $x = \$583$ or 5.83 per cent. on capital invested. This means that if the relative increase of the fixed capital, and the corresponding decrease of the live assets were such as to reduce interest, commissions, etc., from 11 per cent. to 5.83 per cent., wages might remain the same, without interfering with net profits.

(2) *Interest, rent, commissions, etc. remaining the same, find the rate of surplus-value.*

We have:

$$574 = \left(1 + \frac{1}{\sigma}\right) \frac{.20 \times 10{,}000 + .11 \times 10{,}000}{14.5},$$

whence $\sigma = 59$ per cent.

From the formulæ:

$$\left(\frac{s}{l}\right)+\left(\frac{w}{l}\right)=v=574,$$

$$\left(\frac{s}{l}\right):\left(\frac{w}{l}\right)=\sigma=.59,$$

we obtain:

$$\left(\frac{w}{l}\right)=\$361.$$

To keep up the balance, the rate of surplus-value must then be increased from 45 per cent. to 59 per cent., or wages reduced from $397 to $361, a decrease of nine per cent.]

(3) *If interest, rent, commissions, etc. increase to 15 per cent.,*[1] *find the rate of surplus-value.*

We have, as above:

$$574=\left(1+\frac{1}{\sigma}\right)\frac{.20\times 10{,}000+.15\times 10{,}000}{14.5};$$

whence $\sigma=72$ per cent.

The scale of wages will be found[1] to amount to $333, a decrease of over 16 per cent.[2]

In the real case wages have come down lower than that, to $316 a year, which secures to the manufacturer an extra profit of two per cetn. yearly as compared with the stone making industry.

[1] *Cf.* Problem 2.

[2] This is actually the case in the manufacturing of brooms, brushes and mops.—*Loc. cit.* p. 285. Excess of Selling Price over Cost of Production, 37.57 per cent. of capital invested; net profit, 22.18 per cent.; 37.57 − 22.18 = 15.39.